

Claims

[c1] **What is claimed is:**

1. A writing method for CD-MRW comprising:
 - (a) obtaining data to be written to a CD-MRW substrate;
 - (b) determining a write packet range of the data;
 - (c) identifying any defect blocks in the write packet range;
 - (d) identifying breakpoints in the write packet range based on the defect blocks;
 - (e) splitting the write packet range into at least two sub-ranges based on the breakpoints; and
 - (f) individually writing each sub-range.

[c2] 2. The method of claim 1 wherein the sub-ranges comprises:
a continuous packet range located in a data area (DA), the continuous packet range having no defect blocks; and
a defect packet range having a defect block;
wherein different sub-ranges are processed by different writing procedures.

[c3] 3. The method of claim 2 wherein the continuous packet range further comprises:
a complete packet range having wholly continuous packets; and
a partial packet range;
wherein different continuous packet ranges are processed by different writing procedures.

[c4] 4. The method of claim 3 wherein the writing procedure of the complete packet range comprises:
overwriting each packet of the complete packet range directly.

[c5] 5. The method of claim 3 wherein the writing procedure of the partial packet range comprises:

- (a) reading an original partial packet;
- (b) replacing corresponding write blocks in the original partial packet to generate a write packet; and
- (c) writing the entire write packet back over the original partial packet.

[c6] 6.The method of claim 2 wherein the writing procedure of the defect packet range comprises:

- (a)reading a replace packet in a spare area (SA);
- (b)replacing corresponding write blocks in the replace packet to generate a modified replace packet; and
- (c)writing the modified replace packet back to the SA.

[c7] 7.The method of claim 1 wherein the writing method further comprises:

- identifying any SAs in the write packet range; and
- identifying the breakpoints based on the SAs in the write packet range.

[c8] 8.The method of claim 1 wherein the breakpoint indicates a packet having a defect block.

[c9] 9.The method of claim 1 wherein the breakpoint is an SA.

[c10] 10.The method of claim 1 wherein the breakpoint is a partial packet.

[c11] 11.The method of claim 1 wherein the breakpoint is a packet having a defect block.

[c12] 12.A reading method for CD-MRW comprising:

- (a)determining a read block range of the data;
- (b)identifying any defect blocks in the read block range;
- (c)identifying breakpoints in the read block range based on the defect blocks;
- (d)splitting the read block range into at least two sub-ranges based on the breakpoints; and
- (e)individually reading each sub-range.

[c13] 13.The method of claim 12 wherein the sub-ranges comprises:

- a continuous block range located in a DA, the continuous block range having no defect blocks; and
- a defect block range having a defect block;

wherein different sub-ranges are processed by different reading procedures.

[c14] 14.The method of claim 13 wherein the reading procedure of the continuous block range comprises:

- (a) reading a block in the continuous block range; and
- (b) transferring data of the block to a host computer.

[c15] 15. The method of claim 13 wherein the reading procedure of the defect block range comprises:
(a) reading a replace block in an SA; and
(b) transferring data of the replace block to a host computer.